Dependence of supercontinuum spectra generated in photonic crystal fibers on polarization direction of incident femtosecond laser pulse

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Supercontiuum (SC) generation using ultrashort laser pulses has found very useful in spectroscopy, optical coherent tomography, optical frequency metrology, and so on [1]. In recent, there have been many works on generating SC spectra using photonic crystal fibers (PCFS) with high nonlinearity and zero dispersion [2]. The previous works reported the dependence of SC spectra on the peak power and the pulse length of pumping source, and the dispersion of PCF for the pumping wavelength. In this presentation, we report the dependence of SC spectra on the angle between the polarization direction of incident femtosecond laser pulse and the principal axis of PCF employed in the experiment. The measured results indicate that the SC spectra are sensitive to the angle. This is probably due to the complicated core and cladding structures of PCF. The detail analysis of the correlation between the angle dependent SC spectra and the structures should be presented.

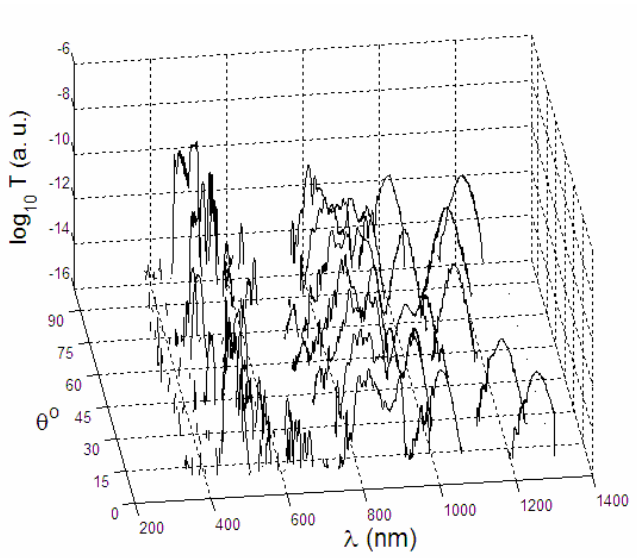

Figure 1. Measured SC spectra as a function of angle θ^o between the polarization direction of pumping pulse and the principal axis of nonlinear polarization maintaining PCF with zero dispersion wavelength of 750 nm (NL PM 750; CRYSTAL FIBRE). The pulse length and the wavelength of pumping pulse are about 100 fs and 830 nm, respectively.

Reference

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[2] J. C. Knight, *Nature* (London), 809, 847 (2003).
[3] M. Lehtonen, G. Genty, H. Ludvigen, and M. Kaivola, *Applied Physics Letters*, **82**, 651, (2003).